

FW-7870 Series

***19" 1U Intel Pentium 4 Socket T Rackmount
Network Security Platform***

User's Manual

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The following information relates to the safety of installation and maintenance personnel. Read all instructions before attempting to unpack, install or operate this equipment, especially before connecting the power adapter.

Please keep the following in mind as you unpack and install this equipment:

- Always follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- Do not apply power into FW-7870 before installation or when disconnecting this product from its original system setup.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Locate a safe and dry location to place this product. Keep it away from wet surfaces/surroundings.
- Never push an object of any kind into this product through openings or empty slots, as you may damage parts.
- Do not attach the power supply cabling to building surfaces. Do not allow anything to rest on the power cabling or allow it to be abused by persons walking on it.
- Distance your working area from moist floors, ungrounded power extension cables, and unavailable safety grounds.
- Avoid installation of this product during a lightning storm.
- Damages caused by electrostatic discharge may result in total or intermittent system failures. To minimize the possibility of ESD damage, an anti-static strap is highly recommended.
- When cleaning or servicing this unit, avoid using highly toxic or aerosol cleaners. Use a clean damp cloth when wiping its surfaces.
- Do not place this device in a tight and sealed location. Place the unit where it can access sufficient airflow to its vent holes (openings along its sides). Never block or cover these openings.
- Do not disassemble this product on your own.

Getting Technical Assistance

Should you encounter questions or problems with your FW-7870, Lanner Electronics is ready to assist you within the guidelines of our product support programs. First, check the electronic product documentation for assistance. If you still cannot find the solution to your problem, contact Lanner sales team with the following information handy:

- FW-7870 model name
- Part number
- Local network configuration details
- The abnormal behavior and/or error messages reported by your network system
- Your questions, or a description of the problem you are experiencing

Call, fax, or e-mail Lanner Electronics for technical support.

Phone: 886-2-8692-6060

Fax: 886-2-8692-6101

E-mail: sales@lannerinc.com

About this Manual

This target audience of this manual includes users, administrators and technicians. This publication is a useful reference when installing, configuring, operating and managing the FW-7870. This breakdown and short descriptions of this manual's contents are as follows:

- Chapter 1 – Introduction provides an overview of the FW-7870 19" 1U Rackmount network security appliance, including its related features, application usage and technical specifications list. The chapter also guides users through the pre and post installation process by listing safety tips plus an overall detailed description of the control board and system and their vital components.
- Chapter 2 – Introduce Hardware Installation
- Chapter 3 – Award BIOS Setup
- *Appendix A – summarizes the specification of the power supply*
- *Appendix B – Watchdog Timer Introduction*
- *Appendix C – Console Redirection*
- *Appendix D – LCD Module and Key Pad*

Table of Contents

Copyright and Disclaimers	ii
Trademark Acknowledgments	ii
Radio Frequency Emissions Notice.....	ii
Safety Instructions.....	iii
Getting Technical Assistance.....	iv
About this Manual.....	iv
Table of Contents.....	v
Chapter 1	I
Getting Started 1	
1.1 Introduction.....	1
1.1.1 Features.....	1
1.2 Technical Specifications.....	2
1.3 Packing Contents.....	3
1.4 MB-X76 System Board.....	4
1.4.1 Board Layout.....	4
1.4.2 Jumper Settings and I/O Connector.....	5
1.4.3 Connector Pin Assignments.....	5
CMOS1:Clear CMOS Data.....	5
CMOS1:Clear CMOS Data.....	5
PS4M1:4 Pin Power Connectr.....	5
PS8P1:8-Pin Power Connector (Xeon-8P Male).....	5
PSC1:24 Pin ATX Power Connector.....	6
COMA1: RS-232 Serial Port #1 Connector (D-Sub).....	6
FAN1-5 : 3 Pin FAN Connector).....	6
PLRS1:Power LED,HD LED,Reset,Speaker Connector(11 Pin 2.54mm).....	6
PSW1:For ATX Power Button.....	6
KPA1 : LCM Keypad.....	6
IRDA1:IRDA1 Connector).....	6
PKMB1: PS/2 Keyboard & Mouse Connector (2x4 Header 2.54mm).....	6
IDEB1 : IDE Interface Connector (40Pin 2.54mm Pitch Header).....	7
LANB1-8 :Type 2(RJ-45 with LED).....	7
PCIB1:124-pin Mini PCI Sockets.....	7
1.5 FW-7870 19" 1U Rackmount Firewall Mechanisms.....	8
1.5.1 Face Panel.....	8
1.5.3 Rear View.....	10
Chapter 2	II
FW-7870 Hardware Installation Guide	II
2.1 Hardware Installation Guide.....	11
Chapter 3	17
Award BIOS Setup	17
3.1 BIOS Setup.....	17
Starting Setup.....	17
Using Setup.....	17
Navigating through the menu bar.....	18
Getting Help.....	18
3.2 Main Menu.....	19
3.3 Standard CMOS Features.....	20
3.4 Advanced BIOS Features.....	22

3.5	Advanced Chipset Features	24
3.6	Integrated Peripherals	26
3.7	Power Management Setup	30
3.8	PnP/PCI Configuration	32
3.9	PC Health Status	33
3.10	Frequency / Voltage Control	34
	CPU Clock Ratio : This item allows you to select the CPU Host / PCI Clock.....	34
3.11	Load Optimized Defaults	34
3.12	Supervisor/User Password Setting.....	34
3.13	Save and Exit Setup	35
3.14	Exit Without Saving	37
Appendix A		38
Appendix B		39
Appendix C		386
Appendix D		48
Terms and Conditions		41
Warranty Policy		44
RMA Service		44

Chapter 1

Getting Started

1.1 Introduction



Figure 1 – FW-7870 Outlook

The FW-7870 is a 1U rackmount network security solution targeting the Enterprise market. The FW-7870 supports Socket T for Intel Pentium 4 processor with 533/800 MHz FSB. It is designed with an Intel 915GV as its northbridge and ICH6(i82801FB) as its southbridge.; All Gigabit ports to be connected from the Southbridge through the ICH6(i82801FB) hub controller's PCI-express and PCI ports, ensuring maximum throughput and performance. For extra flexibility and scalability, the FW-7870 has a Mini PCI slot, users can expand their specifications and performance by simply adding add-on cards to the slot. FW-7870 has two built-in DDR SDRAM DIMM sockets onboard, enough for even the most intensive network security applications. The FW-7870 is a powerful and flexible unit that can meet the vast and various hardware requirement and performance needs of System Integrators, OEM customers and software developers.

1.1.1 Features

Listed below are the key features of FW-7870.

- Supports 3.5" SATA HDD
- Supports Socket T(LGA775) for Intel Pentium 4 processor. Up to 3.6 GHz.
- Supports two DDR DIMM socket (184-pin) up to 2GB DDR SDRAM.
- Supports 4 Gigabit Ethernet ports by PCI-express interface with Marvell 8053, with 4 Gigabit Ethernet ports by PCI interface with Marvell 8001.
- Supports Compact Flash, Mini PCI.
- Support Serial(RS-232), USB 2.0 on front panel.
- 19" 1U Rackmount network security appliance

1.2 Technical Specifications

Model Name	FW-7870
SBC	
SBC	MB-X76A
CPU	Socket T(LGA 775) for Intel Pentium 4 Processor
Chipset	Intel 915GV/Intel i82801FB
BIOS	Award BIOS
Memory	Two 184 pin DDR DIMM
Network interface	4 ports PCI-E by Marvell 8053 Gigabit Ethernet 4 ports PCI by Marvell 8001 Gigabit Ethernet
SSD	one CompactFlash TypeII Socket
I/O Interface	One DB-9 RS-232 connector(Front panel) One USB 2.0 connector (Front panel)
Expansion Slot	One Mini-PCI slot One PCI extension slot in back panel
RTC	Internal RTC with LI battery
Power	1U Power Supply with input Voltage : 100VAC-240VAC and Frequency :47Hz-63Hz
Mechanical/ Environmental	
Form Factor	19" 1U Rackmount
Operating Temperature	0 °C – 40 °C
Storage Temperature	-20 °C – 70 °C
Humidity	5% - 95% RH, non-condensing
Chassis Material	Steel
Dimension	mm
Net Weight	KGS
Certification	CE, FCC CLASS A
Software support	Linux 6.5 and above, Windows 2000/2003/ XP

1.3 Packing Contents

Carefully unpack your package and make sure that you have the following items.

- FW-7870 Network security Platform
- Console cable
- 1.8 meters long cross-over Ethernet cable
- 1.8 meters long straight-through Ethernet cable
- Power cable
- Screw Set
- CPU Cooler * 1
- Slid & Bracket Set

If you find anything missing or damaged, promptly contact your dealer for assistance.

1.4 MB-X76 System Board

MB-X76 is the system board bundled with the FW-7870 Network security platform. The succeeding sections list all MB-X76 related jumper settings and connector pin assignments.

1.4.1 Board Layout



Figure 3 – MB-X76 Jumpers and Connectors

1.4.2 Jumper Settings and I/O Connector

The onboard jumper settings and I/O connector of MB-X76 are custom-tailored to fit the FW-7870 functionality. Changing the jumper settings may result in system malfunction or unforeseen damages.

Jumper Settings and I/O Connector Summary for MB-X76

JUMPER	FUNCTION
CMOS1	Clear CMOS Data
PKMB1	PS/2 keyboard & mouse connector
USBF1	USB port 1 & port 2 connector
CRT1	VGA connector
PSP1	4 pin power connector
FAN1, 2, 3	
LUSBCOM1	
PSC1	
FDCA1	

1.4.3 Connector Pin Assignments

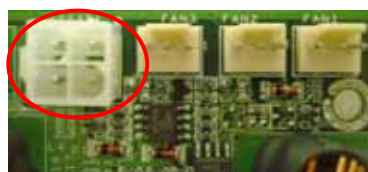
CMOS1: Clear CMOS Data

CMOS1	Description
1-2	Normal (Default)
2-3	Clear CMOS



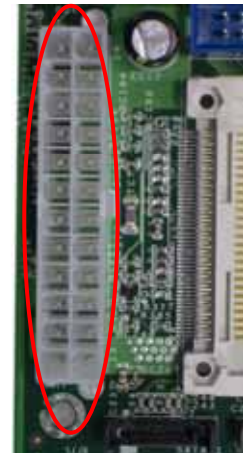
PS4P1: 4-Pin Power Connector (P4-4P Male)

Pin No.	Description
1	GND
2	GND
3	+12V
4	+12V



PSC1:24 Pin ATX Power Connector

Pin No.	Description	Pin No.	Description
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	Ground	15	Ground
4	+5V	16	PSON-
5	Ground	17	Ground
6	+5V	18	Ground
7	Ground	19	Ground
8	Power Good	20	NC
9	Stand-By 5V	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	Ground



FAN1-3 : 3 Pin FAN Connector

Pin No.	Description
1	Ground
2	+12V
3	FAN Status



PKMB1: PS/2 Keyboard & Mouse Connector (2x4 Header 2.54mm)

Pin No.	Description
1	KBCLK
2	Ground
3	NC
4	KBDATA
5	NC
6	MSDATA
7	MSCLK
8	VCC



USBF1 : USB Port #1 & #2 Connector 2x5 Pin 2.54mm

Pin No.	Description	Pin No.	Description
1	USB_VCC	2	Ground
3	Key	4	USBD1+
5	USBD0-	6	USBD1-
7	USBD0+	8	Key
9	Ground	10	USB_VCC



1.5 FW-7880 19” 1U Rackmount Firewall Mechanisms

This section of the manual describes the mechanical and device nomenclature of FW-7880.

1.5.1 Face Panel

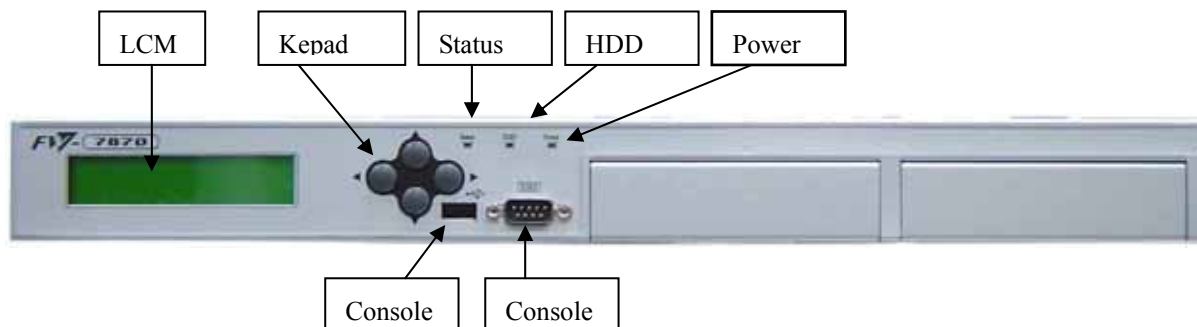


Figure 5 – FW-7870 Face Panel

Face Panel LED Status and Behavior

The following table lists and explains the behavior of each LED on the FW-7870 front panel.

LED	Color	Status	Description
PWR	Green	On	When FW-7870 power is switched ON
	N/A	Off	No power connected
HDD	Yellow	On	Hard disk under access
	N/A	Off	No Data access
Status	Green	On	When system under access
	NA	Off	No power access
Ethernet Ports	Orange	On	The Ethernet cable connect to RJ-45
		Flash	Action
	Green/ Orange	Off	10M
		Green On	100M
		Orange On	1G



- **Console Port:** via the console port cable, this connector attaches FW-7870 to the host PC.
- **LCM & Keypad** Please reference the Appendix B

1.5.3 Rear View



Figure 6 – FW-7870 Rear View

Power Switch

- **Power Switch:** Click the Power Switch , and the system will be power on.



Faulty or improper use of the power adaptor may cause permanent damage to the power supply and the FW-7870. Plug the adaptor to an electrical wall outlet that matches its specifications.

Chapter 2

FW-7870 Hardware Installation Guide

2.1 Hardware Installation Guide

- **Removing the Top Cover**

Step 1 : Unscrew Five screws from the system.

Step 2 : Pull up the top cover

Step 1



Step 2

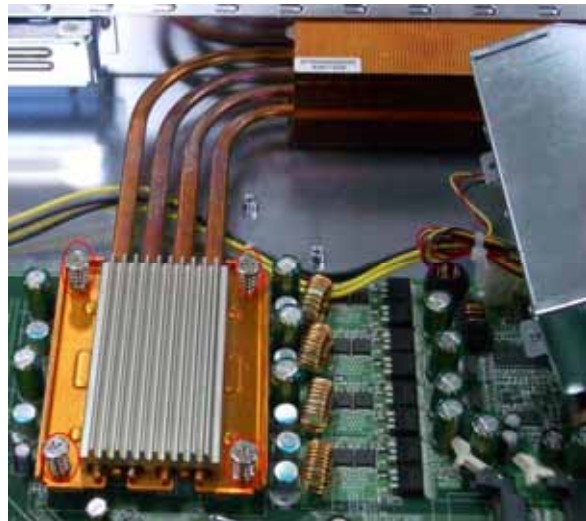


- CPU Installation

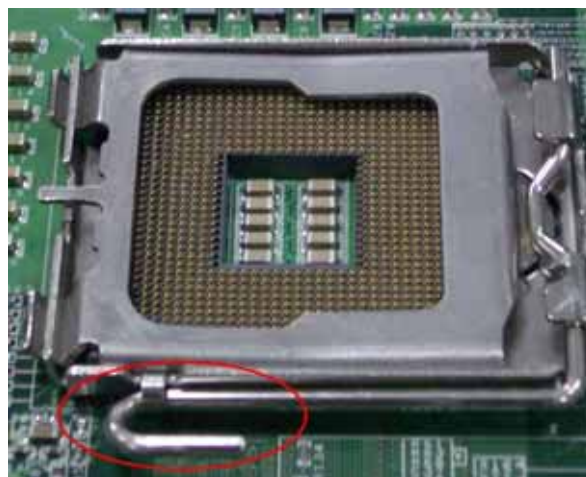
Step 1: Remove the fan cover screw
(3 pcs)



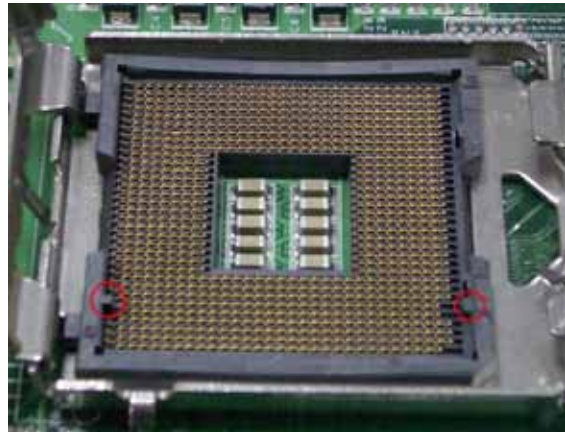
Step 2: To loosen the thermal module screw
(4 pcs)



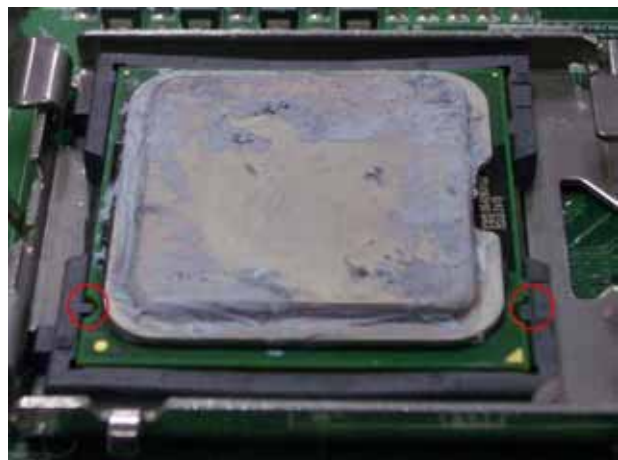
Step 3: Open socket lever by pushing
lever down and away from socket



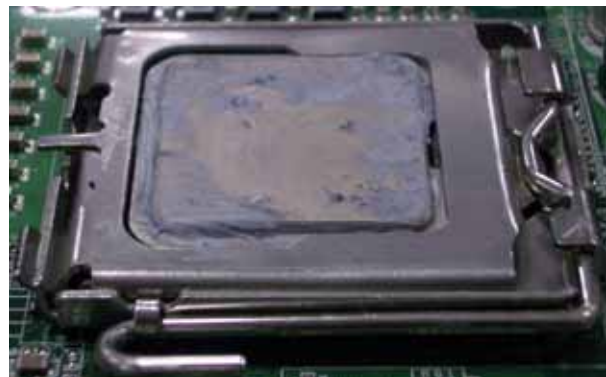
Step 4: Open load plate, (DO NOT TOUCH SOCKET CONTACTS)



Step 5: Align notches with socket.



Step 6: Close load plate. Pressing down on load plate, close and engage socket lever.



Step 7: Place the thermal module onto the main board, lock on the thermal module screw (4pcs), then lock on the fan module screw.



- **System Memory**

- Figure 1: The DIMM slot has a notch, the DIMM memory module only fit in one direction.
- Figure 2: Align the memory notch to the module and push the memory into the DIMM socket

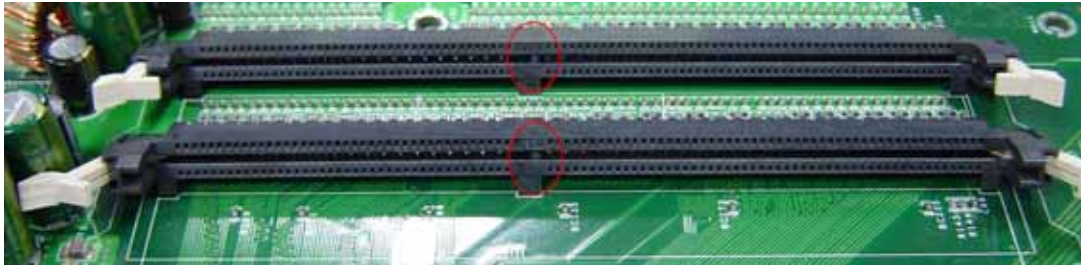


Figure 1-1

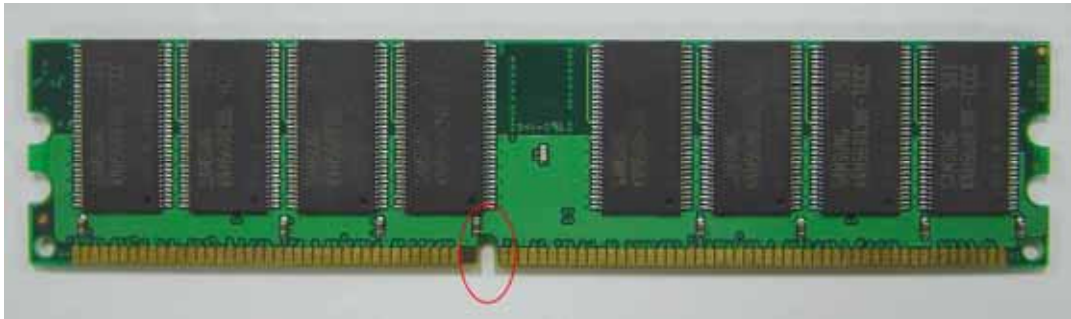


Figure 1-2

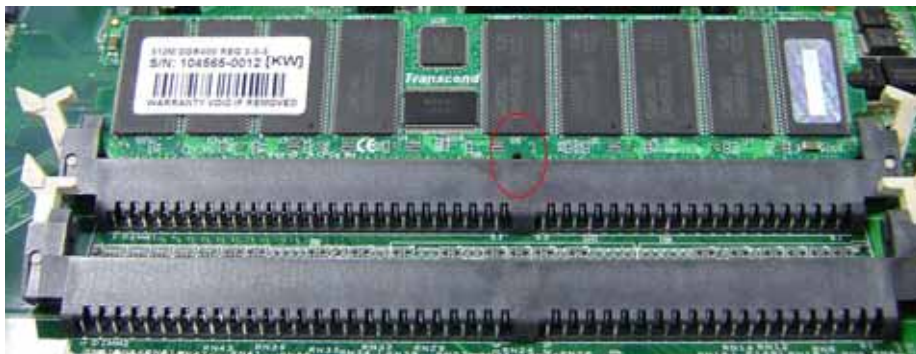


Figure 2-1



Figure 2-2

Installing Hard Disk Drive:

Figure 1: Put the Hard disk on the bracket, and screwing 4 screws.



Figure 1-1



Figure 1-2

Figure 2: plug in the SATA power connector



Figure 2

Figure 3: left side is power connector right side is SATA connector.



Figure 3

Figure 4: Screwing the HDD bracket screws (4pcs).



Figure 4

- Installing Compact Flash Card

Figure 1: Insert the compact flash card into the slot carefully as shown in the picture.



Figure1

- Installing the Mini-PCI Card

Figure 1: Insert the PCI expansion card into the mini-PCI slot at 45 degree.

Figure 2: Push down the PCI expansion card and the PCI expansion card is clicked together completely with the PCI expansion slot.



Figure 1



Figure 2

Chapter 3

Award BIOS Setup

3.1 BIOS Setup

Award's ROM BIOS provides a built-in Setup program that allows users to modify the basic system configuration and settings. The modified data will be stored in a battery-backed CMOS RAM so that this data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM remains unchanged unless there is a configuration change in the system, such as hard drive replacement or new equipment installment.

Starting Setup

The AwardBIOS™ is immediately activated when you first power on the computer. The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing immediately after switching the system on, or
2. By pressing the key when the following message appears briefly at the bottom of the screen during the POST (Power On Self-Test).

Press DEL to enter SETUP.

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to...

PRESS F1 TO CONTINUE, DEL TO ENTER SETUP

Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

< >	Move to previous item
< >	Move to next item
< >	Move to the item in the left hand
< >	Move to the item in the right hand
Enter	Select item

<Esc>	Main Menu - Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu - Exit current page and return to Main Menu
<+/PgUp>	Increase the numeric value or make changes
<-/PgDn>	Decrease the numeric value or make changes
<F1>	General help, only for Status Page Setup Menu and Option Page Setup Menu
<F2>	Item Help
<F5>	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
<F7>	Load the Optimized Defaults
<F9>	System Information
<F10>	Save all the CMOS changes, only for Main Menu

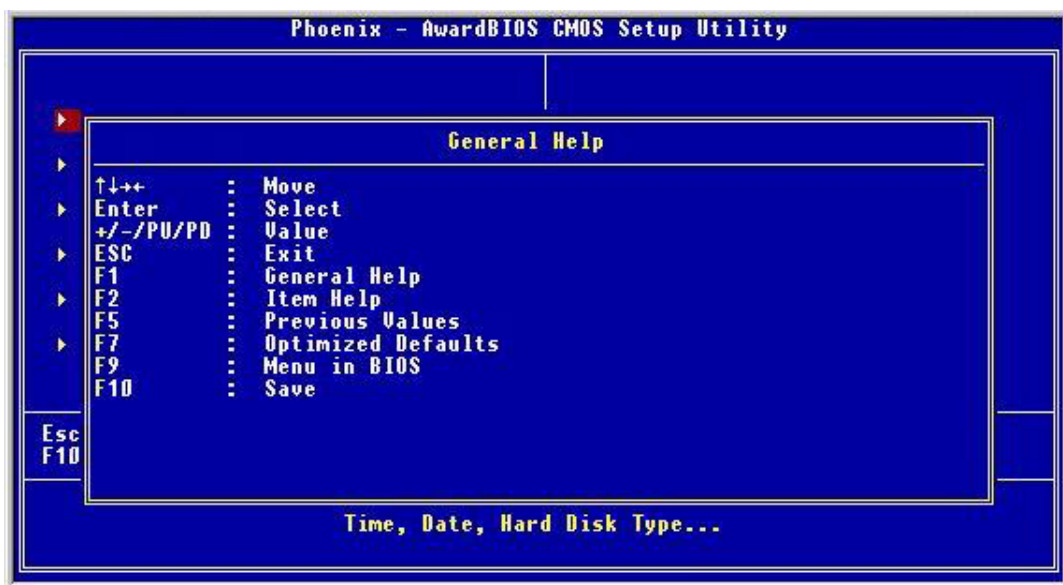
Navigating through the menu bar

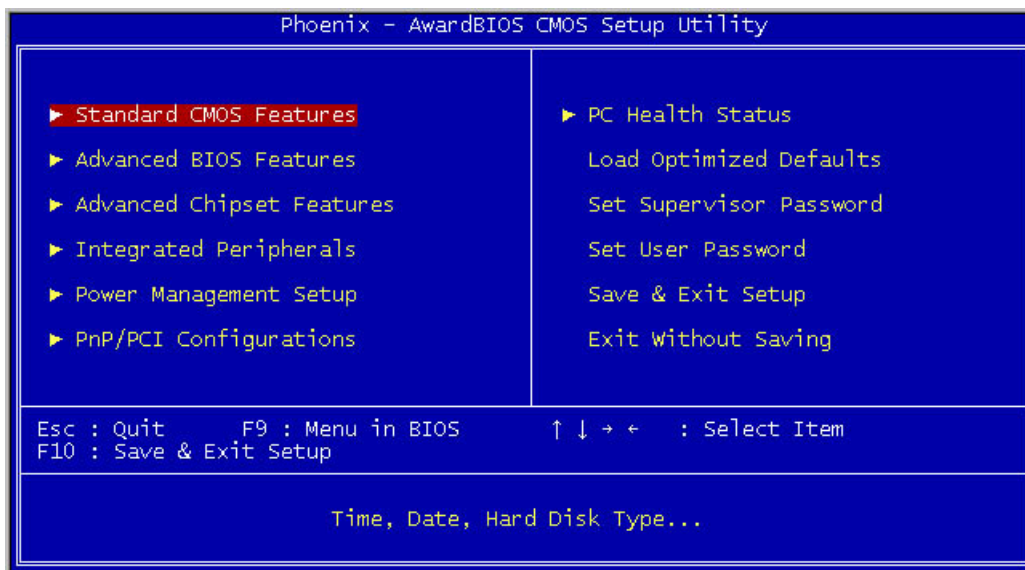
Use the left and right arrow keys to choose the menu you want to be in.

To display a sub menu, use the arrow keys to move the cursor to the sub menu you want. Then press <Enter>. A “!” pointer marks all sub menus.

Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the F10 key again.





3.2 Main Menu

Once you enter the AwardBIOS™ CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

Note that a brief description of each highlighted selection appears at the bottom of the screen.

- **Standard CMOS Features**
Use this menu for basic system configuration.
- **Advanced BIOS Features**
Use this menu to set the Advanced Features available on your system.
- **Advanced Chipset Features**
Use this menu to change the values in the chipset registers and optimize your system's performance.
- **Integrated Peripherals**
Use this menu to specify your settings for integrated peripherals.
- **Power Management Setup**
Use this menu to specify your settings for power management.
- **PnP/PCI Configurations**
This entry appears if your system supports PnP / PCI.
- **PC Health Status**
This setup page is the System auto detect Temperature, voltage, fan, speed.
- **Load Optimized Defaults**
Use this menu to load the BIOS default values that are factory settings for optimal performance system operations.
- **Load Fail-Safe Defaults**
If you made changes to the BIOS and your system becomes unstable as a result, you can change it back to default. However if you made many changes and don't know which one is causing the problem, your best bet is to choose the option "Load Fail Safe Mode Defaults" from the BIOS menu. This uses a minimal performance setting, but the system would run in a stable way. From the dialog box Choose "Y" followed by enter to load Fail-Safe Defaults.

- Set Supervisor password
Use this menu to set Supervisor Passwords.
- Set User password
Use this menu to set User Passwords.
- Save & Exit Setup
Save CMOS value changes to CMOS and exit setup.
- Exit Without Saving
Abandon all CMOS value changes and exit setup.

3.3 Standard CMOS Features

The items in Standard CMOS Setup Menu are divided into 9 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

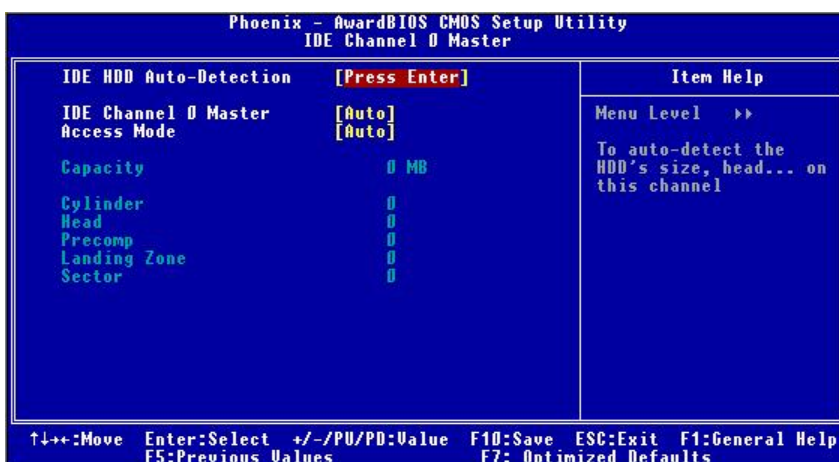


Item	Options	Description
Date	Month DD YYYY	Set the system date. Note that the 'Day' automatically changes when you set the date
Time	HH : MM : SS	Set the system time
IDE Channel 0 Master	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Channel 0 Slave	Options are in its sub menu	Press <Enter> to enter the sub menu of

		detailed options
IDE Channel 1 Master	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Channel 2 Master	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
Halt On	All Errors No Errors All, but Keyboard All, but Diskette All, but Disk/Key	Select the situation in which you want the BIOS to stop the POST process and notify you
Base Memory	N/A	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up
Total Memory	N/A	Displays the total memory available in the system

IDE Adapters

The IDE adapters control the hard disk drive. Use a separate sub menu to configure each hard disk drive.



IDE Primary Master sub menu

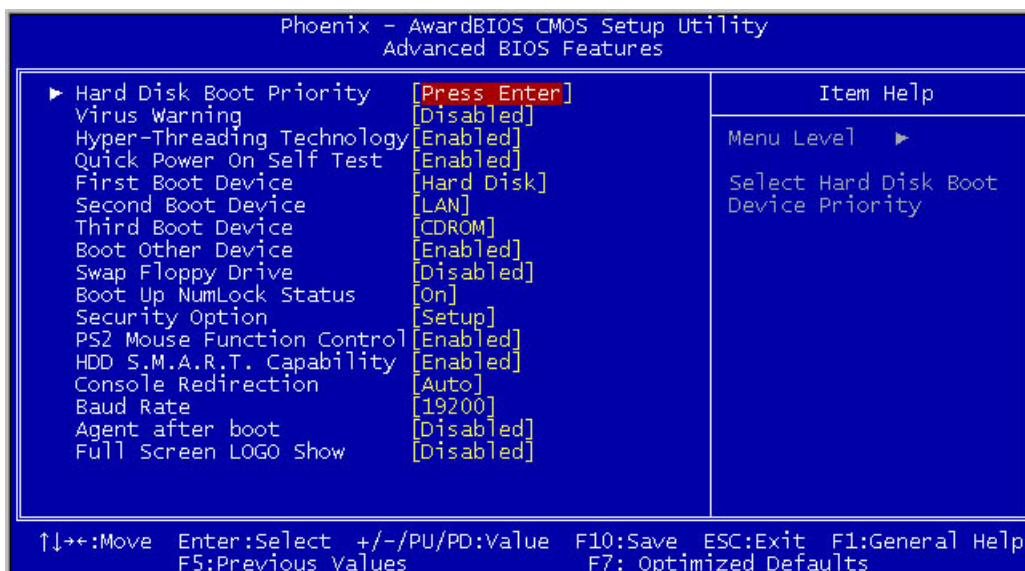
Use the legend keys to navigate through this menu and exit to the main menu. Use Table 1 to configure the hard disk.

Item	Options	Description
IDE HDD Auto-detection	Press Enter	Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.
IDE Channel 0 Master	None Auto Manual	Selecting 'manual' lets you set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE !
Capacity	Auto Display your disk drive size	Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program.
Access Mode	CHS LBA Large Auto	Choose the access mode for this hard disk

Cylinder	Min = 0 Max = 65535	Set the number of cylinders for this hard disk.
Head	Min = 0 Max = 255	Set the number of read/write heads
Precomp	Min = 0 Max = 65535	**** Warning: Setting a value of 65535 means no hard disk
Landing zone	Min = 0 Max = 65535	****
Sector	Min = 0 Max = 255	Number of sectors per track

3.4 Advanced BIOS Features

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.



Virus Warning : The default setting of Virus Warning is “Disabled”. When it is enabled, any attempt to write the boot sector and partition table will halt the system and cause a warning message to appear. If this happens, you can use an anti-virus utility on a virus free, bootable floppy diskette to reboot, to clean and to investigate your system.

CPU L1 & L2 Cache: The option enabled or disabled the internal cache memory in the processor.

CPU L3 Cache: The option enables secondary cache memory. If enabled is selected, external cache memory is enabled. If disabled is selected, external cache memory is disabled.

Hyper-Threading Technology : Allows you to enable or disable the CPU Hyper-Threading Technology feature.

Enabled	Enables CPU Hyper Threading Feature. Please note that this feature is only working for operating system with multi processors mode supported.
Disabled	Disables CPU Hyper Threading Feature.

Quick Power On Self Test : The default setting is “Enabled”. This speeds up the Power On Self Test (POST) by skipping some items that are normally checked during the full POST. If your system is functioning normally, you can choose this feature to speed up the booting process.

First / Second / Third / Other Boot Device : The BIOS attempts to load the operating system from the devices in the sequence selected in these items. The settings are Floppy, LS/ZIP, HDD-0/HDD-1/HDD-2/HDD-3, SCSI, CDROM, LAN, and Disabled

Boot Up Numlock Status : The default setting is “On”. If set “Off”, the cursor controls will function on the numeric keypad.

Gate A20 Option : The default setting is “Fast”. This is the optimal setting for the CPU card. The other option is “Normal”.

Typematic Rate Setting : The default setting is “Disabled”. If enabled, you can set the typematic rate and typematic delay.

Security Option : This setting controls the password in the main screen. The options are “Setup” and “System”. Select “Setup” and it will protect the Setup Utility settings from being tampered with. Select “System” if you want to use password feature every time the system boots up. The default setting is “Setup”. You can create your password by using the “SUPERVISOR/USER PASSWORD” utility on the main program screen.

PS/2 Mouse Function Control : When this option is set *Enabled*, AMIBIOS supports a PS/2 type mouse. The settings are *Enabled* or *Disabled*. The default setting is *Disabled*. System

Boot Up Sequence.

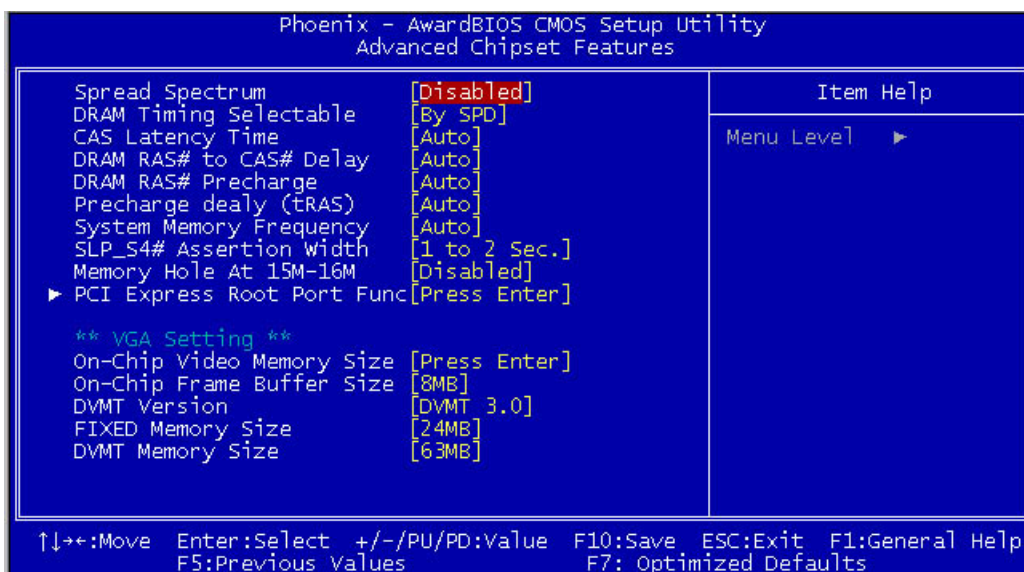
MPS Version Control For OS : An MP Platform interface standard that extends the performance of the existing PC/AT platform beyond the traditional single processor limit, while maintaining 100% PC/AT binary compatibility.

OS Select For DRAM > 64MB : The default setting is “Non-OS2”. Set to “OS2” if the system memory size is greater than 64MB and the operating system is OS/2.

Report No FDD For WIN 95 : Select Yes to release IRQ6 when the system contains no floppy drive, for compatibility with Windows 95 logo certification. In the Integrated Peripherals screen, select Disabled for the Onboard FDC Controller field.

Small logo (EPA) Show: The default setting is ”Enable” which will display EPA logo (small) on the screen during POST process.

3.5 Advanced Chipset Features



DRAM Timing Control :

DRAM Date Integrity Mode : Select Non-ECC or ECC (error-correcting code), according to the type of installed DRAM.

System BIOS Cacheable : Selecting “Enabled” allows caching of the system BIOS ROM at F0000h – FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result. The settings are “Enabled” and “Disabled”.

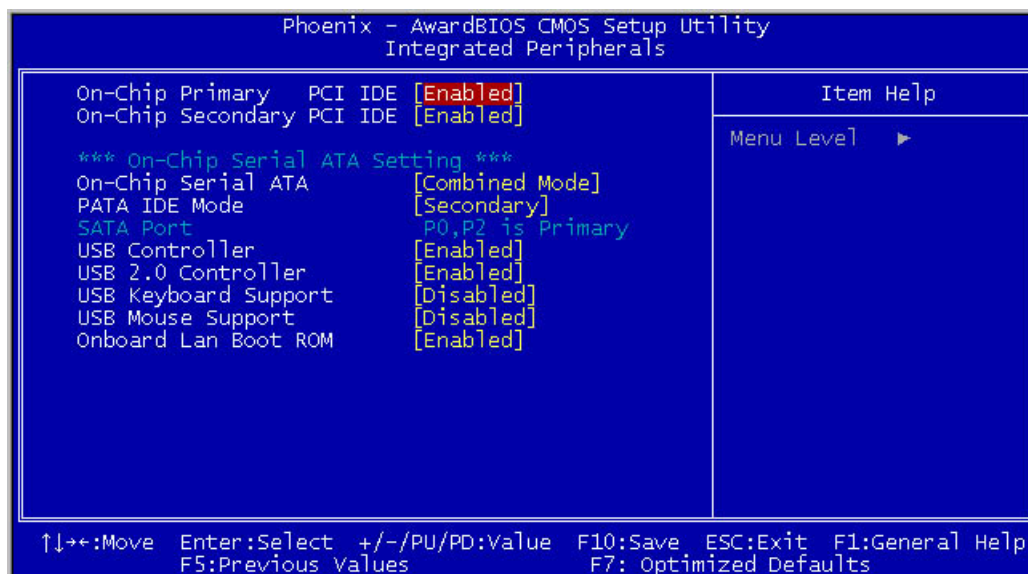
Video BIOS Cacheable: Selecting Enabled allows caching of the video BIOS ROM at C0000h to C7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result.

Memory Hole At 15M-16M: You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements.

Delayed Transaction : The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enable to support compliance with PCI specification version 2.1.

Delay Prior to Thermal : The Delay Prior To Thermal BIOS feature controls the activation of the Thermal Monitor's automatic mode. It allows you to determine when the Thermal Monitor should be activated in automatic mode after the system boots.

3.6 Integrated Peripherals



On-Chip (Primary/Secondary) PCI IDE : The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select Enabled to activate each channel separately.

On-Chip Serial ATA : The integrated peripheral controller contains an Serial ATA interface with support for two Serial ATA channels. Select Enabled to activate each channel separately.

PATA IDE Mode:

IDE Primary / Secondary Master / Slave PIO : The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device. The settings are “Auto”, “Mode 0”, “Mode 1”, “Mode 2”, “Mode 3”, “Mode 4”.

IDE Primary / Secondary Master / Slave UDMA : Ultra DMA/66 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 98 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/66, select Auto to enable BIOS support. The settings are “Auto” and “Disabled”.

Onboard Device : Scroll to this item and press <Enter> to view the following screen:

USB Controller: Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals

USB Keyboard Support : Select Enabled if your system contains a Universal Serial Bus (USB)

controller and you have a USB keyboard.

Onboard LAN Control : This setting controls the onboard LAN Controller.

Enabled	Enable Onboard H/W LAN function.
Disabled	Disable Onboard H/W LAN function.

LPT/LCM Control : Use this option to enable and configure or disable the LPT/LCM port present on the evaluation board.

Configuration options: LPT / LCM

Signal Dual Status LED : This setting is to set the status when the system is powered on.

Configuration options: Green / RED

Status LED : This setting is to set the status when the system is powered.

Configuration options: Always Blight / DARK / 0.1 sec BLINK / 0.5 sec BLINK

Onboard FDC Controller : Select *Enabled* if your system has a floppy disk controller (FDO) installed on the system board and you wish to use it. If you install add-on IDC or the system has no floppy drive, select *Disabled* in the field.

Configuration options: Enabled / Disabled

Onboard Serial Port 1/2 :

Auto	BIOS will automatically setup the port address.
3F8/IRQ4	Enable onboard Serial port and address is 3F8.
2F8/IRQ3	Enable onboard Serial port and address is 2F8.
3E8/IRQ4	Enable onboard Serial port and address is 3E8.
2E8/IRQ3	Enable onboard Serial port and address is 2E8.
Disabled	Disable onboard Serial port .

UART Mode Select : The serial port on your system may offer a variety of infrared port modes. Click here for a description of various modes.

UR2 Duplex Mode (Half) : This field is available when UART 2 Mode is set to either ASKIR or IrDA. This item enables you to determine the infrared function of the onboard infrared chip. The options are Full and Half (default).

Full-duplex means that you can transmit and send information simultaneously. Half-duplex is the transmission of data in both directions, but only one direction at a time.

Onboard Parallel Port : This item allows you to determine onboard parallel port controller I/O address setting. The settings are “378H/IRQ7”, “278H/IRQ5”, “3BC/IRQ7”, “Disabled”.

Parallel Port Mode : Select an operating mode for the onboard parallel (printer) port. Select “Normal”, “Compatible”, or “SPP” unless you are certain your hardware and software both support one of the other available modes.

ECP Mode Use DMA : Select a DMA channel for the parallel port for use during ECP mode. The settings are “3” and “1”.

SuperIO Device : Scroll to this item and press <Enter> to view the following screen:

Power On Function/ KB Power ON Password/ Hot Key Power On : This item allows the user to power on the system by pressing hot-keys, or typing in a password .

Onboard Serial Port 1 / Port 2 : : Select an address and corresponding interrupt for the first and second serial ports. The settings are “3F8/IRQ4”, “2E8/IRQ3”, “3E8/IRQ4”, “2F8/IRQ3”, “Disabled”, “Auto”.

UART Mode Select (Normal) : This field is available if the Onboard Serial Port 2 field is set to any option but Disabled. UART Mode Select enables you to select the infrared communication protocol: Normal (default), IrDA, or ASKIR. IrDA is an infrared communication protocol with a maximum baud rate up to 115.2K bps. ASKIR is Sharp's infrared communication protocol with a maximum baud rate up to 57.6K bps.

RXD, TXD inverting enable : This item allow you to enable the TXD, RXD inverting which depends on different H/W requirement. This field is not recommended to change its default setting for avoiding any error in your system.

IR Transmission Delay : When UART Mode is selected in IrDA or ASKIR mode, it allows you to enable / disable

UR2 Duplex Mode (Half) : This field is available when UART 2 Mode is set to either ASKIR or IrDA. This item enables you to determine the infrared function of the onboard infrared chip. The options are Full and Half (default).

Full-duplex means that you can transmit and send information simultaneously. Half-duplex is the transmission of data in both directions, but only one direction at a time.

Use IR Pins : Consult your IR peripheral documentation to select the correct setting of the TxD and RxD signals. The choice: IR-RX2TX2, RXD2 TXD2.

Onboard Parallel Port : This item allows you to determine onboard parallel port controller I/O address setting. The settings are “378H/IRQ7”, “278H/IRQ5”, “3BC/IRQ7”, “Disabled”.

Parallel Port Mode : Select an operating mode for the onboard parallel (printer) port. Select “Normal”, “Compatible”, or “SPP” unless you are certain your hardware and software both support one of the other available modes.

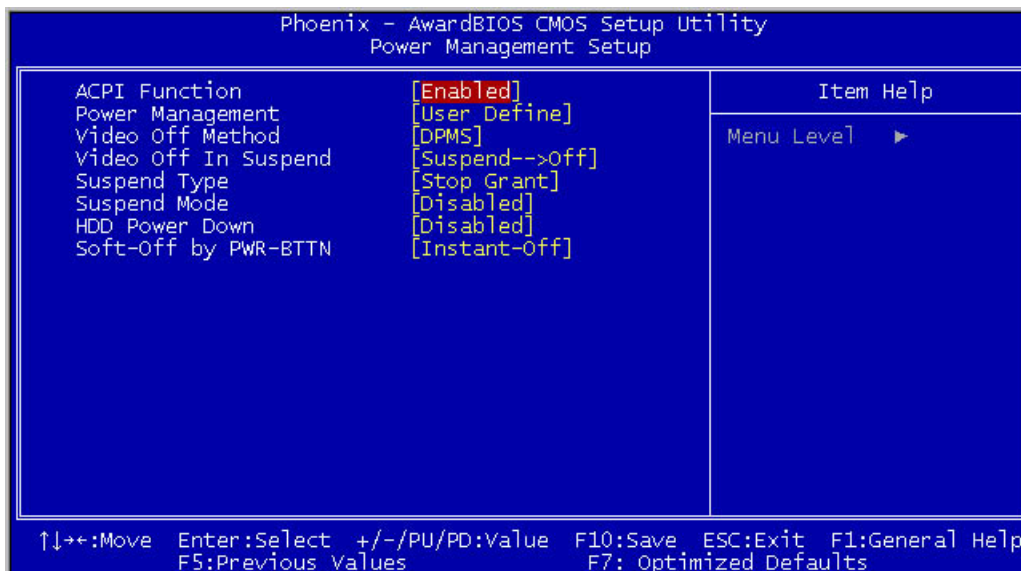
EPP Mode Select : Select EPP port type 1.7 or 1.9.

ECP Mode Use DMA : Select a DMA channel for the parallel port for use during ECP mode. The settings are “3” and “1”.

PWRON After PWR-Fail (Off) : This item enables your computer to automatically restart or return to its last operating status after power returns from a power failure.

3.7 Power Management Setup

The Power Management Setup allows you to configure your system to most effectively save energy while operating in a manner consistent with your own style of computer use.



ACPI Function : This item allows you to enable or disable the Advanced Configuration and Power Management (ACPI). The settings are “Enabled” and “Disabled”.

Power management : This option allows you to select the type (or degree) of power saving for Doze, Standby, and Suspend modes.

This table describes each power management mode:

Max Saving	Maximum power savings. Only Available for SL CPUs.
User Define	Set each mode individually.
Min Saving	Minimum power savings.

Video Off Method

This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management signaling.

Video Off In Suspend

This determines the manner in which the monitor is blanked.

Configuration options: Suspend->off / Always ON

Suspend Type

Select the Suspend Type. Configuration options: PWRON Suspend / Stop Grant

Suspend Mode

When enabled and after the set time of system inactivity, all devices except the CPU will be shut off. Configuration options: Disabled / 1 Min / 2 Min / 4 Min / 8 Min / 12 Min / 20 Min / 30 Min / 40 Min / 1 Hour .

HDD Power Down

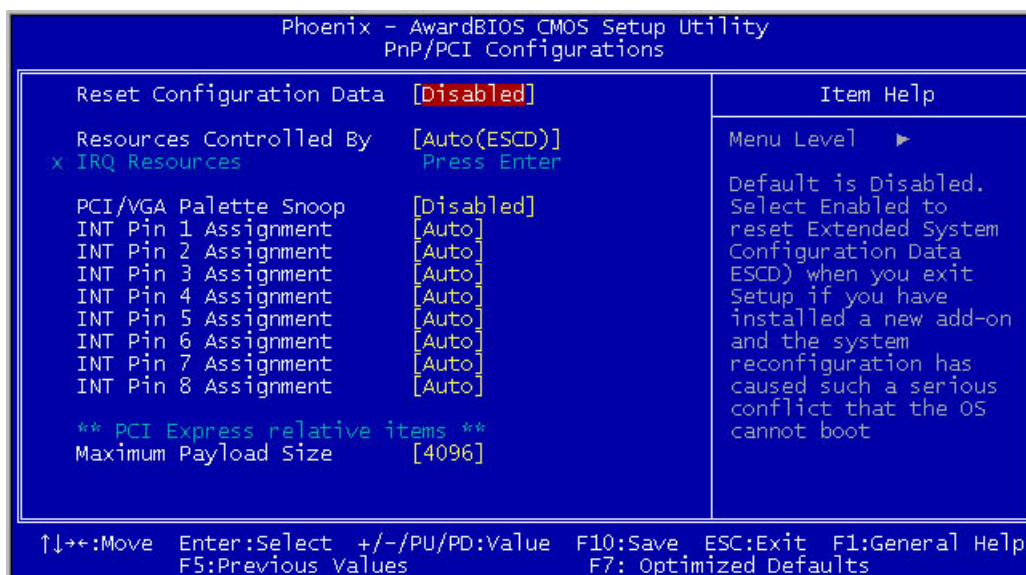
When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

Configuration options: Disabled / 1 Min / 2 Min / 3 Min / 4 Min / 5 Min / 6 Min / 7 Min / 8 Min / 9 Min / 10 Min / 11 Min / 12 Min / 13 Min / 14 Min / 15 Min

Soft-Off by PWR-BTTN : Pressing the power button for more than 4 seconds forces the system to enter the Soft-Off state. The settings are: “Delay 4 Sec.”, “Instant-Off”.

3.8 PnP/PCI Configuration

This section describes configuring the PCI bus system. PCI, or **Personal Computer Interconnect**, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.



Reset Configuration Data

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system can not boot.

Configuration options: Enabled / Disabled

Resource controlled by

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows95. If you set this field to "manual" choose specific resources by going into each of the sub menu that follows this field (a sub menu is preceded by a "!").

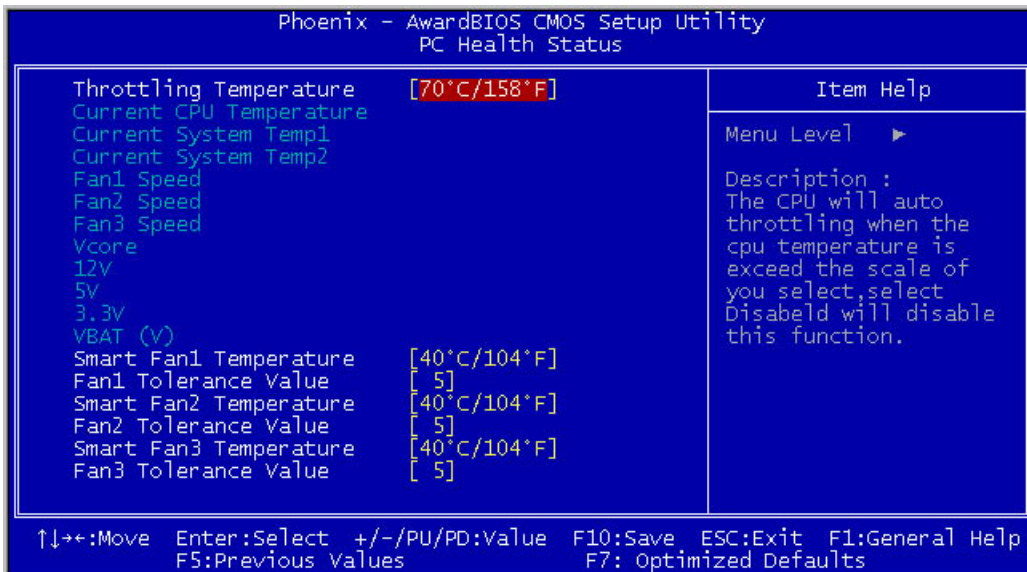
Configuration options: Auto (ESCD) / Manual

PCI/VGA Palette Snoop

Leave this field at *Disabled*.

Configuration options: Enabled / Disabled

3.9 PC Health Status



Throttling Temperature

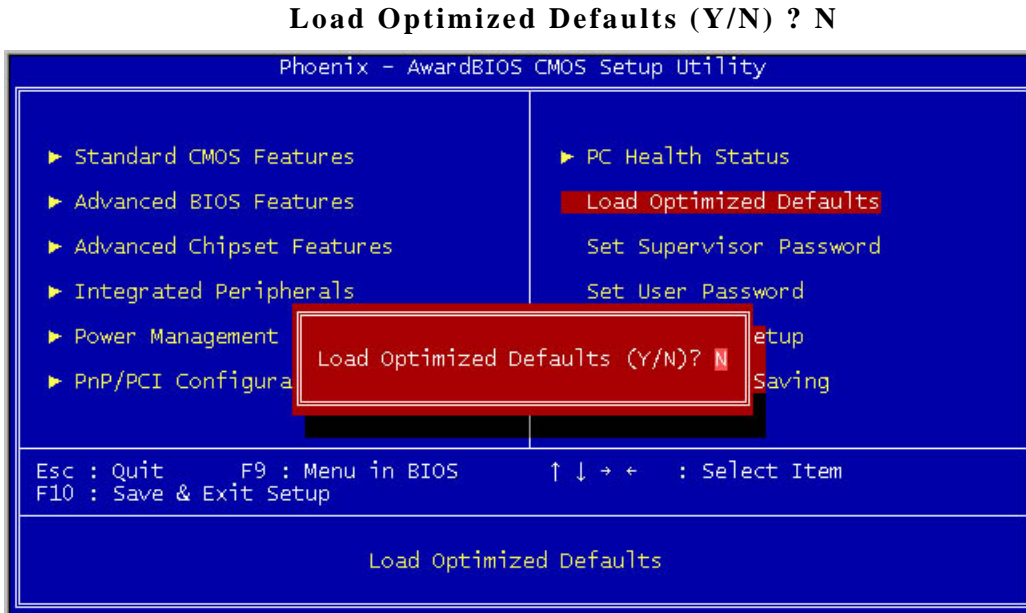
Detect CPU temperature automatically.

FAN 1 / FAN 2 / FAN 3

Detect Fan1 / FAN2 speed status automatically .

3.11 Load Optimized Defaults

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:



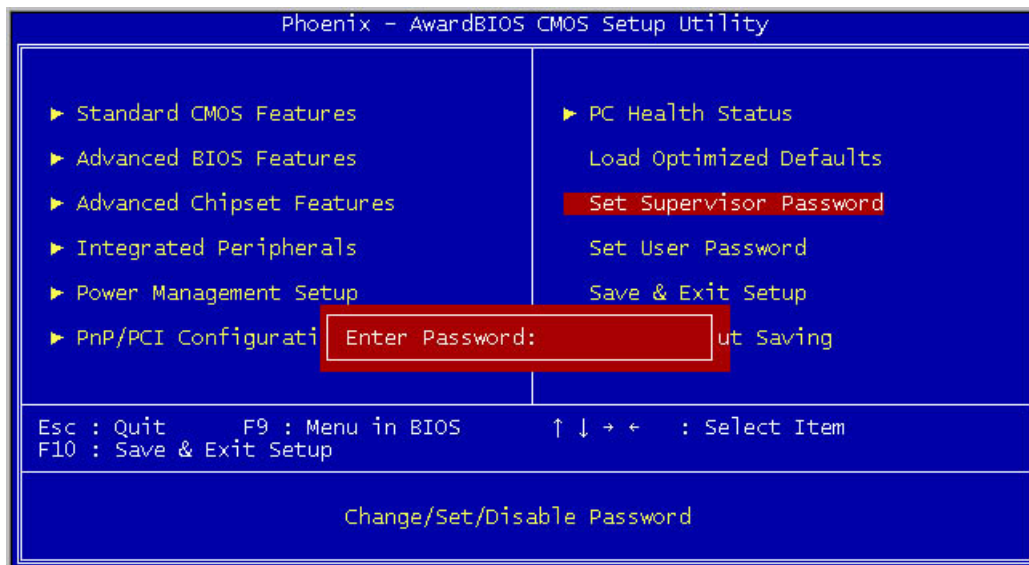
3.12 Supervisor/User Password Setting

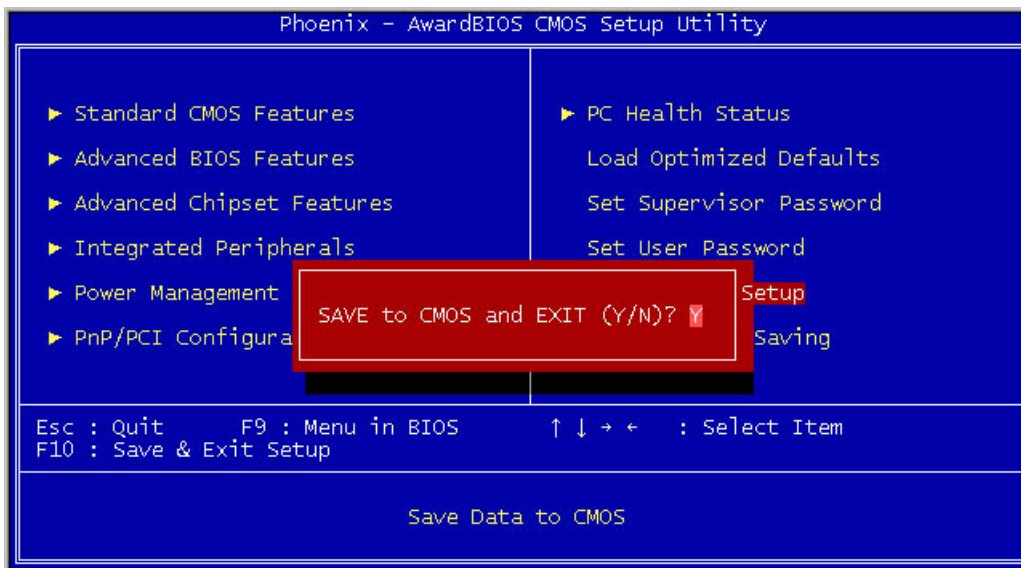
You can set either supervisor or user password, or both of them. The differences between are:

Supervisor password: can enter and change the options of the setup menus.

User password: just can only enter but do not have the right to change the options of the setup menus.

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.





ENTER PASSWORD:

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

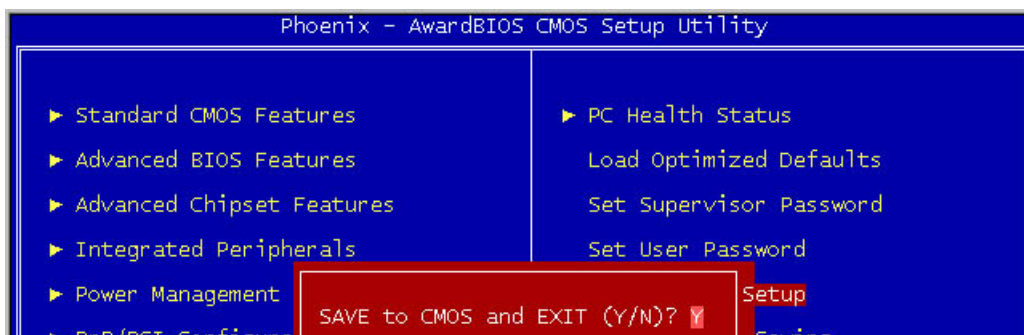
PASSWORD DISABLED:

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 3). If the Security option is set to “System”, the password will be required both at boot and at entry to Setup. If set to “Setup”, prompting only occurs when trying to enter Setup.

3.13 Save and Exit Setup



Pressing <Enter> on this item asks for confirmation:

Save to CMOS and EXIT (Y/N)? Y

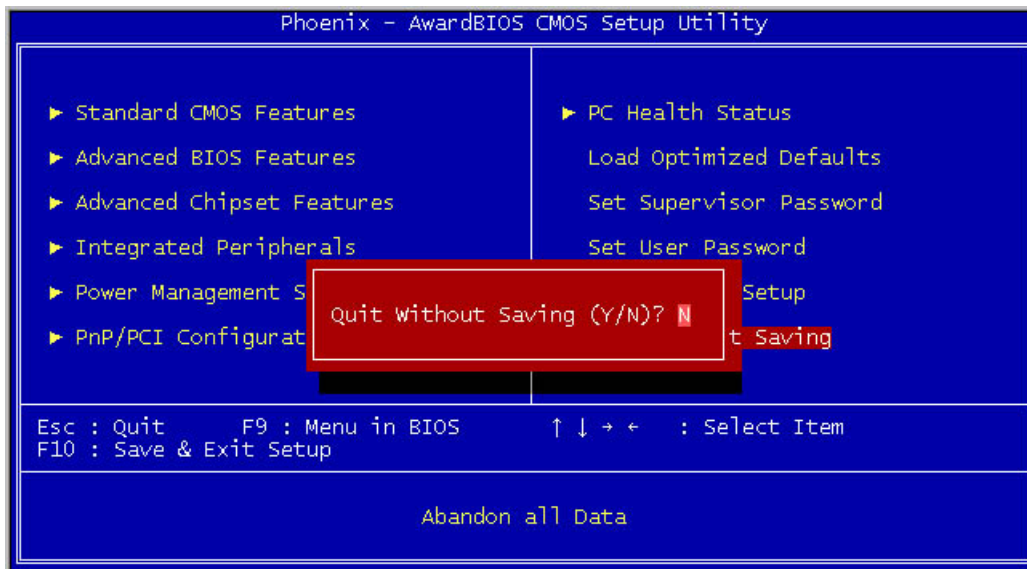
Pressing “Y” stores the selections made in the menus in CMOS – a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

3.14 Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

Quit without saving (Y/N)? Y

This allows you to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.



Appendix A

Power Supply

Power Supply Specification

AC Input Spec :

VOLTAGE 90 ~ 264 VAC FULL RANGE

Output Specifications

Output Voltage	Output Current Min.	Output Current Max.	Output Current Peak	Regulation Load	Regulation Line	Output Ripple & Noise Max.[P-P]
5V	2	30.00		± 5%	± 1%	50mV
12V	2	32.00		± 5%	± 1%	120mV
-5V	0.05	0.70		+5 ~ -10%	± 1%	120mV
-12V	0.05	0.70		+5 ~ -10%	± 1%	120Mv
3.3V	1	24		± 5%	± 1%	50mV
+5VSB	0.1	2		+ 6 ~ -5%	± 1%	50mV

Feature :

- *Active PFC (full range), MEET IEC-1000-3-2 CLASS D
- *12V Max. Current : 32A
- *EMPERATURE RANGE : OPERATING 0 ~ 40 , STORAGE -20 ~ 70
- *DUAL EMI NOISE INLET FILTER: FCC CLASS B, CISPR22 CLASS B
- *SAFETY: UL 1950, CSA 22.2 NO/ 950, TUV IEC 950
- *HOT-SWAPPABLE / HOT-PLUGGABLE REDUNDANCY FUNCTION
- *Use 48-pins industrial connectors
- *Cooling: TWO 38x38x28 mm DC FANS
- *AC Inlet in each module

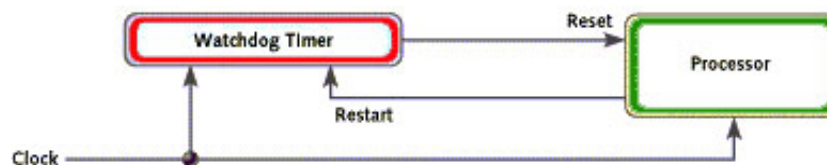
Appendix B

Watchdog Timer

Introduction

Most systems need to be self-reliant. It's not usually possible to wait for someone to reboot them if there are some component wrong. Some system designs, such as space probes, are simply not accessible to human operators. If the system ever hangs, such systems are permanently disabled. In other cases, the speed with which a human operator might reset the system would be too slow to meet the uptime requirements of the product.

A watchdog timer is a piece of hardware that can be used to automatically detect system anomalies and reset the processor if any occur. Generally speaking, a watchdog timer is based on a counter that counts down from some initial value to zero. The software selects the counter's initial value and periodically restarts it. If the counter ever reaches zero before the software restarts it, the software is presumed to be malfunctioning and the processor's reset signal is asserted. The processor will be restarted as if a human operator had cycled the power.



Detail Register Descriptions

A watchdog action consists of a series of watchdog instructions. A watchdog instruction is the operation on a register region. This section describes the detail register in LPC I/O(W83627HF).

Watch Dog Timer Control Register

Watch Dog Timer is controlled by CRF5, CRF6, CRF7 of Logical Device.

CRF5 (PLED mode register. Default 0x00)

Bit 7-6 : select PLED mode

- = 00 Power LED pin is tri-stated.
- = 01 Power LED pin is driven low.
- = 10 Power LED pin is a 1Hz toggle pulse with 50 duty cycle
- = 11 Power LED pin is a 1/4Hz toggle pulse with 50 duty cycle.

Bit 5-4 : Reserved

Bit 3 : select WDTO count mode.

- = 0 second
- = 1 minute

Bit 2 : Enable the rising edge of keyboard Reset(P20) to force Time-out event.

= 0 Disable

= 1 Enable

Bit 1-0 : Reserved

CRF6 (Default 0x00)

Watch Dog Timer Time-out value. Writing a non-zero value to this register causes the counter to load the value to Watch Dog Counter and start counting down. If the Bit 7 and Bit 6 are set, any Mouse Interrupt or Keyboard Interrupt event will also cause the reload of previously-loaded non-zero value to Watch Dog Counter and start counting down. Reading this register returns current value in Watch Dog Counter instead of Watch Dog Timer Time-out value.

Bit 7 - 0 = 0x00 Time-out Disable

= 0x01 Time-out occurs after 1 second/minute

= 0x02 Time-out occurs after 2 second/minutes

= 0x03 Time-out occurs after 3 second/minutes

= 0xFF Time-out occurs after 255 second/minutes

CRF7 (Default 0x00)

Bit 7 : Mouse interrupt reset Enable or Disable

= 1 Watch Dog Timer is reset upon a Mouse interrupt

= 0 Watch Dog Timer is not affected by Mouse interrupt

Bit 6 : Keyboard interrupt reset Enable or Disable

= 1 Watch Dog Timer is reset upon a Keyboard interrupt

= 0 Watch Dog Timer is not affected by Keyboard interrupt

Bit 5 : Force Watch Dog Timer Time-out, Write only

= 1 Force Watch Dog Timer time-out event; this bit is self-clearing.

Bit 4 : Watch Dog Timer Status, R/W

= 1 Watch Dog Timer time-out occurred

= 0 Watch Dog Timer counting

Bit 3 - 0 : These bits select IRQ resource for Watch Dog. Setting of 2 selects SMI.

Notes : Lanner provide the sample code in the manual/driver CD. The path is under //WATCHDOG

Appendix C

Console Redirection

Console redirection allows you to maintain a system from a remote location by re-directing keyboard input and text output through the serial port. This section will tell you how to use console redirection.

1. Please insert console cable between on FW-7870 and Remote Client System.
2. Setup BIOS in FW-7870.
BIOS → Advanced Chipset Features → Baud Rate : 115200 (Default)
BIOS → Advanced Chipset Features → Console Redirection : Enabled(Default)

Enabled	Attempt to redirect console via COM port.
Disabled	Attempt to redirect console when keyboard absent.
Auto	If keyboard is plug in the Controller board, the Console Redirection will not display BIOS screen on remote client. If keyboard is not plug in the Controller board, the Console Redirection will display BIOS screen on remote client.

3. Configure Console redirection on client system. This example is for Windows platform.
 - i . Click the Start button, point to **programs → Accessories → Communications**, and click **Hyper Terminal**.
 - ii. Enter any name for the new connection and select any icon.
 - iii. Click OK.
 - iv. From the Connect to pull-down menu, select a COM port available on your client system and click OK.
 - v. Select **Baud Rate → 115200** , **Flow control →None** , **Data bit→8** , **Parity check → None** , **Stop bit → 1**.
4. Power on FW-7870 and it will display the bios information on the client system.

Appendix D

LCD Module and Key Pad For FW-7870

Purpose

The purpose of this document is to provide installation information for the LCD module and key pad installed in the FW-7870.

Specification overview

The LCD module is designed to provide real-time operating status and configuration information for the system. You can reference the document in the Manual/Driver CD for detail specification. The path is under //LCD Module Sample Code/LCD_Datasheet.pdf.

The Driver and library is in the Manula/Driver CD. The path is under //LCD Module Sample Code

How to install the driver in Windows 2000/XP.

In the W2K_WinXP folder,

[LCM.SYS → Windows 2000/XP Driver](#)

[LCM.REG → Windows 2000/XP Registry](#)

1. In Windows 2000, copy LCM.SYS to \\Winnt\system32\drivers
In Windows XP , copy LCM.SYS to \\windwos\system32\drivers
2. Double click the LCM.REG and select “YES”
3. Restart the system.

[LCM1.LIB → LCM & Keypad library](#)

1. Copy LCM1.LIB to your make tool directory.
2. If you use "Visual Studio C", add LCM1.LIB path to your Complie Setting

How to install in Linux

[LLCM1.O → LCM & Keypad library](#)

1. Copy LCM1.O to your make tool directory.
Ex. if your test program file name is 'LLCM2.c'
2. Compile: 'gcc LLCM1 -o LLCM2 LLCM2.c'
then use root to run ./LLCM2 for excution.

LCM & KeyPad Function Library description

Description :

1. Clear_LCM();

=>This Function is Clear the LCD Module.

=>Direct write the function to your program.

2.Read_KeyPad();

=>This Function get the KeyPad number if user pressed key.

=>Direct write function to your program.

Ex.

```
int a;  
a=Read_KeyPad();
```

Return Value: "1"=>The Upper Key

"2"=>The Down Key

"3"=>The Enter Key

"4"=>The ESC Key

3.Show_Data(int Dp_Type1,int Dp_Type2,int Dp_Type3,int Dp_Type4, char *Showdata1, char *Showdata2);

=>Show string Function.

=>Dp_type1 => Entry Mode Set

=>Dp_type2 => Display On/Off

=>Dp_type3 => Shift

=>Dp_type4 => Set Function

Please refer the Data Sheet about LCM and Use Decimal to input

=>Showdata1 & Showdata2 are the strings that you want to show.

=>Showdata1 Shown on Line1 Limited between 20 Character

=>Showdata2 Shown on Line2 Limited between 20 Character

Ex.

```
Show_data(0,15,0,56,"1234","5678");
```

Terms and Conditions

Date:2004.07.08

Warranty Policy

1. All products are warranted against defects in materials and workmanship for a period of two years from the date of your purchase.
2. The buyer will bear the return freight charges for goods returned for repair within the warranty period; whereas manufacturer will bear the after service freight charges back to user site.
3. The buyer will pay for repair (for replaced components plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.
4. If the RMA Service Request Form does not meet the stated requirement as listed on “RMA Service“, RMA goods will be returned at customer’s expense.
5. The following conditions resulting to the defective goods are excluded from this warranty:
 - A. Improper or inadequate maintenance by the customer
 - B. Unauthorized modification, misuse, or reversed engineering of the product
 - C. Operation outside of the environmental specifications for the product.

RMA Service

1. Requesting for a RMA#:

To obtain a RMA number, simply fill out and fax the “RMA Request Form” to your supplier.

2. Shipping:

- A. The customer is required to fill up the problem code as listed. If your problem is not among the codes listed, please write the symptom description on the remark.
- B. Ship the defective unit(s) on freight prepaid terms.
- C. Mark the RMA # clearly on the box.
- D. Customer is responsible for shipping damage(s) resulting from inadequate/loose packing of the defective unit(s).
- E. Use the original packing materials whenever possible.

3. All RMA# are valid for 30 days only:

RMA goods received after the effective RMA# period will be rejected.

RMA Service Request Form

When requesting RMA service, please fill out this **RMA Service Request Form**.

Without this form your RMA will be REJECTED!!!

RMA No: _____		Reasons to Return: <input type="checkbox"/> Repair(Please include failure details) <input type="checkbox"/> Testing Purpose	
Company: _____		Contact Person: _____	
Phone No. _____		Purchased Date: _____	
Fax No.: _____		Applied Date: _____	
Return Shipping Address: _____			
Shipping by: <input type="checkbox"/> Air Freight <input type="checkbox"/> Sea <input type="checkbox"/> Express _____ <input type="checkbox"/> Others: _____			
Item	Model Name	Serial Number	Configuration

Item	Problem Code	Failure Status

*Problem Code:

- | | | | |
|------------------------|------------------------------|--------------------|--------------------------|
| 01:D.O.A. | 07: BIOS Problem | 13: SCSI | 19: DIO |
| 02: Second Time R.M.A. | 08: Keyboard Controller Fail | 14: LPT Port | 20: Buzzer |
| 03: CMOS Data Lost | 09: Cache RMA Problem | 15: PS2 | 21: Shut Down |
| 04: FDC Fail | 10: Memory Socket Bad | 16: LAN | 22: Panel Fail |
| 05: HDC Fail | 11: Hang Up Software | 17: COM Port | 23: CRT Fail |
| 06: Bad Slot | 12: Out Look Damage | 18: Watchdog Timer | 24: Others (Pls specify) |

Request Party

Confirmed By Supplier

Authorized Signatures / Date

Authorized Signatures / Date

